These rules regarding the subdivision of gaseous currents, while extremely simple and elementary in character, have received very little attention from metallurgists. The experienced chimney builder, who installs hot-air-heating apparatus in residences, is well acquainted with these laws, which are absolutely ignored by a number of very eminent engineers.

A number of examples of incorrect furnace construction are shown below. These furnaces are designed to work in complete or partial opposition to the foregoing rules; they accordingly work very poorly, and many of them have had fco be completely abandoned.

In industrial practice, so many of these defectively designed furnaces are encountered that it is absolutely impossible to enumerate all of them. It is therefore thought that the best method of illustrating these defects will be a systematic description of the various types of furnaces and heating apparatus, with a brief description of the correct and incorrect constructions.

They will be taken up in the following order:

I. Vertical Regenerators;
II. Horizontal Regenerators;
3. Hot-blast Stoves;
4. Hot-blast Temperature Equalizers;
V. Iron Tube Hot Blast or Air Heaters;
VI. Steam Boilers;
VII. Chamber Furnaces, Brick and Pottery Kilns;
VIII. Cementation Furnaces;
IX. Annealing Furnaces for Malleable Iron ;
X. Continuous or Multiple-chamber Kilns;
XL Muffle Furnaces;
XIL Vertical Furnaces for Tempering, Annealing and Heat Treating;
5. Horizontal Tempering Furnaces;
6. Annealing and Heating Furnaces for Boiler Plates;
XV. Coal-fired Reverberatory Furnaces;
XVI. Siemens or Regenerative Heating Furnaces;
XVII. Pit Furnaces, Heating and Soaking Pit;

XVIII. Continuous-heating Furnaces;

XIX. Tunnel Furnaces.